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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/774,820

Applicant(s)

TANNER ET AL.

Examiner

BJ Forman

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Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 January 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2, 4, 9, 13, 14, 16, 20, 21, 38 and 39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4, 9, 13, 14, 16, 20, 21, 38 and 39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

FINAL ACTION

Status of the Claims

1. This action is in response to papers filed 17 January 2008 in which claims 1 and 39 were amended and a substitute Oath was submitted. The amendments have been thoroughly reviewed and entered.

The previous rejections in the Office Action dated 18 September 2007, not reiterated below, are withdrawn in view of the amendments. Applicant's arguments have been thoroughly reviewed and are discussed below as they apply to the instant grounds for rejection. New grounds for rejection, necessitated by the amendments, are discussed.

Claims 1-2, 4, 9, 13-14, 16, 20-21 and 38-39 are under prosecution.

Oath/Declaration

2. The corrected Oath has been reviewed and is entered.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 2, 4, 9, 13-14, 16, 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Glazer et al (U.S. Patent No. 6,824,866, filed 7 April 2000, having priority to 60/128,402, filed 8 April 1999) in view of Renfrew et al (U.S. Patent No. 5,885,431, issued 23 March 1999).

Regarding Claim 1, Glazer et al disclose a substrate for attaching analytes, the substrate comprising a porous predominately inorganic layer derived from a frit of particles adhered to a flat, rigid non-porous, inorganic understructure (glass microscope slide), the inorganic layer having a plurality of interconnected voids that extend through to a top surface of the porous inorganic layer (Fig. 2, pores #128, Column 10, lines 38-53 and Column 29, lines 58-62). It is noted that the instant specification defines frit layer of individual particles as glass particles e.g. borosilicate (¶ 48 and 56). Glazer et al define the particle layer as borosilicate particles (Columns 9-10 and Fig. 1-2). Glazer et al further teach the voids are "open" and/or filled with gas (Column 9, lines 30-41 and Column 29, lines 58-62). Glazier et al teach the porous layer is adhered to a flat, rigid non-porous, inorganic understructure (glass microscope slide), but is silent regarding an intervening layer for adhesion. However, intervening particulate glass layers of differing transition temperatures, which provide adhesion between the layers was well known and routinely practiced in the art at the time the claimed invention was made as taught by Renfrew et al.

Renfrew et al teach a layered substrate is adhered using a particulate glass frit having a melting temperature different from the substrates being adhered and further teaches the importance of matching thermal expansion coefficients of the layered substrate so as to prevent fractures during use of the substrate (Column 6, lines 20-40).

It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the intervening glass adhesive layer of Renfrew et al to the substrate of Glazer et al. One of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success and for the added benefit of adhering the substrate layers of Glazer without risk of substrate fracture during use as taught by Renfrew et al (Column 6, lines 20-40).

Regarding Claim 2, Glazer et al disclose the substrate further comprises a uniform coating of a binding agent (e.g. silanes) over at least part of the surface area (Column 11, lines 36-45 and Column 13, lines 52-60).

Regarding Claim 4, Glazer et al disclose the substrate wherein the binding agent is a cationic polymer i.e. aminopropyl-silane (Column 7, lines 11-17 and Column 13, lines 52-60).

It is noted that the instant specification defines the silane binding agent GAPS as γ -aminopropyltriethoxysilane (GAPS) (page 7, lines 3); γ -aminopropylsilane (GAPS)- (page 11, line 10).

Regarding Claim 9, Glazer et al disclose the substrate wherein the porous inorganic layer is a material that is transparent e.g. silicate, aluminosilicate, boroaluminosilicate, borosilicate glass or light-transmitting fibers (Column 5, lines 41-60 and Column 9, lines 19-20).

Regarding Claim 13, Glazer et al disclose the substrate wherein the inorganic layer has a thickness of about $5\mu\text{m}$ (Column 2, lines 28-30)

Regarding Claim 14, Glazer et al disclose the substrate wherein the particles have a mean size of about $3.5\mu\text{m}$ (Column 11, lines 25-27).

Regarding Claim 16, Glazer et al disclose the substrate wherein the voids have mean size of about 0.3 to $20\mu\text{m}$ (Column 7, lines 19-25).

Regarding Claim 20, Glazer et al disclose the substrates provide a sensitivity of at least one order of magnitude greater than comparable non-porous substrates (Column 24, lines 8-13 and Column 33, lines 3-8).

Regarding Claim 21, Glazer et al disclose the substrate wherein the porous inorganic layer is derived from at least partial sintering (Column 10, lines 28-34).

5. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over by Glazer et al (U.S. Patent No. 6,824,866, filed 7 April 2000, having priority to 60/128,402, filed 8 April 1999) in view of Renfrew et al (U.S. Patent No. 5,885,431, issued 23 March 1999) as applied to Claim 1 above and further in view of Kuroita et al (U.S. Patent No. 5,990,302, filed 11 July, 1997).

Regarding Claim 14, Glazer et al disclose a substrate for attaching analytes, the substrate comprising a porous predominately inorganic layer derived from a frit of particles adhered to a flat, rigid non-porous, inorganic understructure (glass microscope slide), the inorganic layer having a plurality of interconnected voids that extend through to a top surface of the porous inorganic layer (Fig. 2, pores #128, Column 10, lines 38-53 and Column 29, lines 58-62). It is noted that the instant specification defines frit layer of individual particles as glass particles e.g. borosilicate (§ 48 and 56). Glazer et al teach the particles have a size of about 3.5µm (Column 11, lines 25-27). Furthermore, the preferred size for silica particles was known to be about 3.5µm as taught by Kuroita (Column 5, lines 18-26). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the preferred size for silica particles as known in the art to the silica particles of Glazer. One of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success based on the preferred teaching of Kuroita (Column 5, lines 18-26).

6. Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over by Glazer et al (U.S. Patent No. 6,824,866, filed 7 April 2000, having priority to 60/128,402, filed 8 April 1999) in view of Sun et al (U.S. Patent No. 6,129,603, issued 10 October 2000).

Regarding Claim 38, Glazer et al disclose a planar substrate for attaching analytes, the substrate comprising a porous inorganic layer derived from a frit of particles adhered to a flat,

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rigid non-porous, inorganic understructure (glass microscope slide), the inorganic layer having a plurality of interconnected voids that extend through to a top surface of the porous inorganic layer (Fig. 2, pores #128, Column 10, lines 38-53 and Column 29, lines 58-62), the voids having a predetermined mean size of not less than about 0.1 μ m dispersed throughout the layer (Column 11, lines 20-35). It is noted that the instant specification defines frit layer of individual particles as glass particles e.g. borosilicate (§ 48 and 56).

Glazer et al do not specifically teach tape- cast frits. However, layered structure formed using tape- cast glass frits was well known and routinely practiced in the art at the time the claimed invention was made as taught by Sun et al who teaches that tape casting provides layers having the desired shape and thickness (Column 5, lines 64-67). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the tape-cast layers of Sun et al to the glass frit layers of Glaser et al. One of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success and for the advantage of obtaining layers of desired shape and thickness as taught by Sun (Column 5, lines 64-67).

7. Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over by Glazer et al (U.S. Patent No. 6,824,866, filed 7 April 2000, having priority to 60/128,402, filed 8 April 1999) in view of Sun et al (U.S. Patent No. 6,129,603, issued 10 October 2000) as applied to Claim 38 above and further in view of Renfrew et al (U.S. Patent No. 5,885,413, issued 23 March 1999).

Regarding Claim 39, Glazier and Sun et al teach the elements of Claim 38 as discussed above. Glazier et al teach the porous layer is adhered to a flat, rigid non-porous, inorganic understructure (glass microscope slide), but is silent regarding an intervening layer for

adhesion. However, intervening particulate glass layers of differing transition temperatures cast onto the substrate and provide adhesion between the layers was well known and routinely practiced in the art at the time the claimed invention was made as taught by Renfrew et al.

Renfrew et al teach a layered substrate is adhered using a particulate glass frit having a melting temperature different from the substrates being adhered and further teaches the importance of matching thermal expansion coefficients of the layered substrate so as to prevent fractures during use of the substrate (Column 6, lines 20-40).

It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the intervening glass adhesive layer of Renfrew et al to the substrate of Glazer et al. One of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success and for the added benefit of adhering the substrate layers of Glazer without risk of substrate fracture during use as taught by Renfrew et al (Column 6, lines 20-40).

8. Claims 1, 2, 4, 13, 22, 25, 31, 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Havens et al (U.S. Patent No. 6,306,348, filed 15 July 1999) in view of Renfrew et al (U.S. Patent No. 5,885,413, issued 23 March 1999).

Regarding Claim 1, Havens et al disclose a substrate comprising an inorganic layer derived from particles adhered to a flat, rigid, non-porous inorganic understructure e.g. electrode (Column 3, lines 15-27 and Fig. 9), the inorganic layer having a plurality of interconnected voids dispersed throughout i.e. porous gel (Column 3, lines 28-37 and Column 10, lines 1-10).

Havens et al teach the porous layer is adhered to a flat, rigid non-porous, inorganic understructure, but are silent regarding an intervening layer for adhesion. However,

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intervening particulate glass layers of differing transition temperatures cast onto the substrate and provide adhesion between the layers was well known and routinely practiced in the art at the time the claimed invention was made as taught by Renfrew et al.

Renfrew et al teach a layered substrate is adhered using a particulate glass frit having a melting temperature different from the substrates being adhered and further teaches the importance of matching thermal expansion coefficients of the layered substrate so as to prevent fractures during use of the substrate (Column 6, lines 20-40).

It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the intervening glass adhesive layer of Renfrew et al to the substrate of Havens et al. One of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success and for the added benefit of adhering the substrate layers of Glazer without risk of substrate fracture during use as taught by Renfrew et al (Column 6, lines 20-40).

Regarding Claims 2 and 4, Havens et al disclose the substrate is coated with a binding agent e.g. aminopropylsilane (Column 9, lines 52-60).

Regarding Claim 13, Havens et al disclose the inorganic layer has a thickness of about 5 μm (Column 5, lines 56-59).

9. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over by Havens et al (U.S. Patent No. 6,306,348, filed 15 July 1999) in view of Renfrew et al (U.S. Patent No. 5,885,413, issued 23 March 1999) and further in view of Kuroita et al (U.S. Patent No. 5,990,302, filed 11 July, 1997).

Regarding Claim 14, Havens et al disclose a substrate comprising an inorganic layer derived from particles adhered to a flat, rigid, non-porous inorganic understructure e.g. electrode (Column 3, lines 15-27 and Fig. 9), the inorganic layer having a plurality of interconnected voids dispersed throughout i.e. porous gel (Column 3, lines 28-37 and Column 10, lines 1-10).

Havens et al teach the preferred particles are silica (Column 3, lines 15-27) but they are silent regarding a mean of 3.5 μ m. However, the preferred size for silica particles was known to be about 3.5 μ m as taught by Kuroita (Column 5, lines 18-26). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the preferred size for silica particles as known in the art to the silica particles of Havens. One of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success based on the preferred teaching of Kuroita (Column 5, lines 18-26).

10. Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over by Havens et al (U.S. Patent No. 6,306,348, filed 15 July 1999) in view of Sun et al (U.S. Patent No. 6,129,603, issued 10 October 2000).

Regarding Claim 38, Havens et al disclose a substrate comprising an inorganic layer derived from particles adhered to a flat, rigid, non-porous inorganic understructure e.g. electrode (Column 3, lines 15-27 and Fig. 9), the inorganic layer having a plurality of interconnected voids dispersed throughout i.e. porous gel (Column 3, lines 28-37 and Column 10, lines 1-10).

Havens et al do not specifically teach tape-cast frits. However, layered structure formed using tape-cast glass frits was well known and routinely practiced in the art at the time the claimed invention was made as taught by Sun et al who teaches that tape casting provides

layers having the desired shape and thickness (Column 5, lines 64-67). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the tape-cast layers of Sun et al to the glass frit layers of Havens et al. One of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success and for the advantage of obtaining layers of desired shape and thickness as taught by Sun (Column 5, lines 64-67).

11. Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over by Havens et al (U.S. Patent No. 6,306,348, filed 15 July 1999) in view of Sun et al (U.S. Patent No. 6,129,603, issued 10 October 2000) as applied to Claim 38 above and further in view of Renfrew et al (U.S. Patent No. 5,885,413, issued 23 March 1999).

Regarding Claim 39, Havens et al disclose a substrate comprising an inorganic layer derived from particles adhered to a flat, rigid, non-porous inorganic understructure e.g. electrode (Column 3, lines 15-27 and Fig. 9), the inorganic layer having a plurality of interconnected voids dispersed throughout i.e. porous gel (Column 3, lines 28-37 and Column 10, lines 1-10).

Havens et al teach the porous layer is adhered to a flat, rigid non-porous, inorganic understructure, but are silent regarding an intervening layer for adhesion. However, intervening particulate glass layers of differing transition temperatures cast onto the substrate and provide adhesion between the layers was well known and routinely practiced in the art at the time the claimed invention was made as taught by Renfrew et al.

Renfrew et al teach a layered substrate is adhered using a particulate glass frit having a melting temperature different from the substrates being adhered and further teaches the importance of matching thermal expansion coefficients of the layered substrate so as to prevent fractures during use of the substrate (Column 6, lines 20-40).

It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the intervening glass adhesive layer of Renfrew et al to the substrate of Glazer et al. One of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success and for the added benefit of adhering the substrate layers of Glazer without risk of substrate fracture during use as taught by Renfrew et al (Column 6, lines 20-40).

Response to Arguments

12. Applicant asserts that Glazer and Meissner do not teach the invention as newly claimed. The argument has been considered but is deemed moot in view of the amendments, withdrawn rejection and new grounds for rejection based on the amendments.

Applicant also asserts that Havens and Meissner do not teach the invention as newly claimed. The argument has also been considered but is deemed moot in view of the amendments, withdrawn rejection and new grounds for rejection based on the amendments.

Applicant further asserts that Sun is not available as prior art because the publication date is later than the effective filing date for the instant claims. The assertion is noted, however according to MPEP § 2141, prior art is defined under 35 U.S.C. 103 it is defined under 35 U.S.C. 102, except when the prior art is a reference under subsections (e), (f), and (g) and the subject matter was own by or under obligation to the same person at the time the invention was made.

2141 [R-6] Examination Guidelines for Determining Obviousness Under 35 U.S.C. 103.

35 U.S.C. 103. Conditions for patentability; non-obvious subject matter.

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having

ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

(c)(1) Subject matter developed by another person, which qualifies as prior art only under one or more of subsections (e), (f), and (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the claimed invention was made, owned by the same person or subject to an obligation of assignment to the same person.(emphasis added)

Conclusion

13. No claim is allowed.
14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BJ Forman whose telephone number is (571) 272-0741. The examiner can normally be reached on 6:00 TO 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ram Shukla can be reached on (571) 272-0735. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BJ Forman
Primary Examiner
Art Unit 1634

/BJ Forman/
Primary Examiner, Art Unit 1634